Stand UP to Quakes - Get Your Home in Shape!

Up to 160,000 households will be unable to sleep in their own homes following the next big earthquake in the Bay Area because they will be so badly damaged. **Will yours be one of them?**

Protect your safety and reduce potential damage to your home.

Scientists now predict that a large quake in the Bay Area is about twice as likely to happen as not to happen during the next 30 years. Are you betting your home's value and your safety on odds like that?

It's usually easy and not very expensive to strengthen your home to be safer in an earthquake. Then you will know you should be able to live in it after an earthquake – and have minimal damage to repair.

Retrofitting Works!

Take The Quiz:

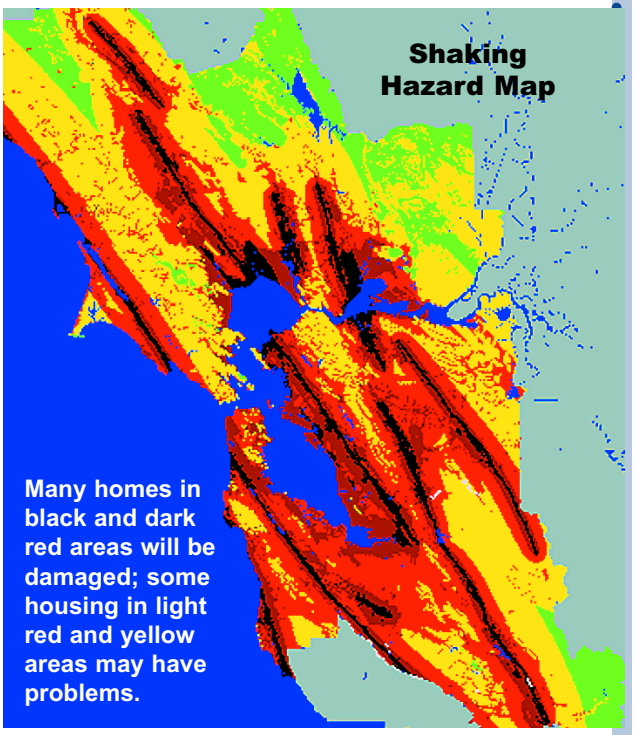
Is your home healthy enough to stand up in a quake?

1. **What color does the shaking intensity map below show for your neighborhood?**
   Red, dark red, or black is . . . . **7 points**
   Yellow is . . . . . **5 points**
   Green or blue is . . . . . **3 points** _____

2. **When was your home built?**
   Before 1950 is . . **5 points**
   1950 - 1960 is . . **4 points**
   1961 - 1978 is . . **3 points**
   1979 - now is . . . **1 point**
   _____

3. **How tall is it?**
   (select MOST appropriate)
   2 or more stories is . . . . . **5 points**
   Split-level or on hill is . . . . . **6 points**
   1 story, 3 or more steps to front door is . . **4 points**
   1 story, less than 3 steps to front door is . . **1 point**
   _____

Total Points _____



If your home earned 13 or more points, it probably needs to be made stronger to keep you and your family safer, unless it has been strengthened in the last few years.

Look inside for information & these featured stories

- Seven Steps for Strengthening
- Frequently Asked Questions
- Meet People Who Strengthened Their Homes
- Retrofitting Works!

and more.....

Go to http://quake.abag.ca.gov/ for more information and more detailed shaking maps.

Seven Steps for Strengthening

STEP 1

Take the QUIZ on the first page of this booklet.

If your home earned 13 or more points, it probably needs to be made stronger to keep you and your family safer, unless it has been strengthened in the last few years. The threat of earthquake damage to your home is based on its particular location, when it was built, and how tall it is.

STEP 2

Get a bid with costs and a detailed proposal with plans from three contractors.

Get bids from at least three contractors. The contractors should show exactly what is going to be done, referencing appropriate building codes. Ask each contractor for two professional references (such as engineers or architects) and for two homeowner references.

STEP 3

Call the references for all three contractors.

Ask the professional references these questions.

A - Have you ever worked with this contractor on retrofitting a home?
B - How many retrofits do you think this contractor does each year?
C - Is this contractor competent to perform a retrofit (tell them about your home)?

Ask the homeowner references these questions.

A - Did this contractor do your work in a timely manner?
B - Would you recommend this contractor?

STEP 4

Call your city or county building department regarding the three plans and proposals you received.

At the present time, there is no standardized way to retrofit homes. The three contractors each may propose completely different ways of strengthening your home. Cities have a policy of not recommending individual contractors. Call your building department to see if you can take the proposed plans from the three contractors to that office. Some city and county building departments will review the plans and discuss with you which designs are consistent with commonly used retrofitting guidelines.

STEP 5

Select the contractor.

With information from professional and homeowner references and possible building department comments, you can select the contractor best able to do the job.

STEP 6

Make sure that the contractor gets a building permit from the city or county and at the end of the job has the permit signed off by the city or county inspector.

The building permit is your record of the completed work. As part of the permit process, the inspector will go out to the job in various stages and verify that the work is being done correctly. This is particularly important if you have not hired an engineer.

STEP 7

Invite your friends and neighbors over to help you celebrate a safer home! Being safer is a wonderful reason to celebrate!

East Bay Family Does Work Themselves

We decided to do our own work under the house because of the type of person I am. I'd rather do the work myself - whether it's paint or foundation work - or retrofit. And I've got a good helper, my wife! ***Ron Kramer***

We decided to do the retrofit, first of all, for safety - to protect ourselves. But also because we've been in our home so long. If we should lose our home in a major earthquake, I think it would be devastating because this home is who we are. ...There may be damage, but at least the house will be repairable and all the work and the years and the time that we've put into our house will still be here for us. ***Chris Kramer***

Frequently Asked Questions

What is strengthening?

Strengthening involves ensuring that your home is adequately attached to its foundation and has plywood in its crawl space. Split-level homes and two-story homes need more work.

Can I do any of this work myself?

Yes, homeowners who have done other home improvements can do it themselves. If you plan to do the work, you need to take a training class. Remember that the area under your house can be an unpleasant work environment!

How do I find an experienced contractor?

Use a list of contractors with retrofit training, such as ABAG's web site at **http://quake.abag.ca.gov/contractors.html.** Ask for two professional references (architects or engineers), as well as for two homeowners who have used his/her services.

Will I need to hire an engineer?

Sometimes you need to hire a design professional, such as an engineer, particularly if your home is more than one story (even if the home is only a split level), has a bedroom or other living area over a garage, or is on a steep hillside. The engineer will charge $1,000 to $5,000, depending on the complexity of the job.

How do I select the engineer?

The engineer should be a licensed civil or structural engineer with experience in designing retrofits for homes. A good engineer will not add unnecessary strengthening and will add the strength where it is least expensive for the contractor to install.

Do I need a building permit from the city or county?

Yes, permits are required by law. When you obtain a building permit, you also have some assurance that the work will be completed correctly. You really need that permit to protect your investment.

How much do permits cost?

Typically, cities and counties charge very little for these permits. However, some cities do not charge at all. A typical permit costs about $250. Call your city.

How much will this cost me?

Although costs vary, the typical home retrofit that does not require an engineer costs about $4,500. A lot can be done for $2,500.

How can I get the money to pay for this?

Home equity loans are available from banks. A five-year loan from a bank for $5,000 for 5 years at 9% will cost you about $104 a month, far less than putting this home strengthening on your credit card. Homeowners with low fixed incomes may be able to get help in paying for the work from their city or county, or from the California Department of Insurance.

Retrofit Work Costs Less Than Repairing This Damage

Northridge Retrofit Success

A family spent $3,200 in 1993 retrofitting their home built in 1911. None of their neighbors did any work. When the 1994 Northridge earthquake hit, this home was the **only one** on both sides of the street for two blocks that was **not damaged**.

James Russell, Codes Consultant

Peninsula Family Hires a Contractor

Both of us have been through two natural disasters - a major hurricane ... and a flood... It makes natural disasters seem very real. ...If you think it's tough to get a contractor these days, imagine a situation where you have 10,000 homes that need repair.

You never know when and at what time it's going to hit. ... If it happens in the middle of the night, then two adults can ...[protect themselves more easily than]...if there's a baby or there's a small child in a crib, then you can't really run to a safer area.

Bertil Chappuis and Carmen Munoz

Retrofitting Works!

You don't have to sit back and wait for the next earthquake to destroy your home.

In 1989, at the corner of Center and Elm streets in downtown Santa Cruz, architect Michael O'Hearn unwittingly created a laboratory for the study of seismic retrofit design. On that corner, at 214 and 210 Elm Street, were two identical Victorian style homes.

O´Hearn offers this advice, " It's a lot cheaper to retrofit a house now than to repair it after an earthquake."
210 Elm Street, Santa Cruz

The twin homes were built by the same builder, with identical materials and using the same construction techniques. When O'Hearn bought them in 1984, he started by retrofitting #210. Unfortunately, he had not yet retrofited #214 before the Loma Prieta earthquake hit on Oct. 17, 1989.

The home at 214 Elm Street "came apart in four sections," O'Hearn said. However, 210 Elm Street, with its plywood shear panels and bolted foundation, suffered only minor damage. "The one we had retrofitted (210 Elm St.) cost us $5,000 to repair. The other one (214 Elm St.) cost us $260,000 to repair. The whole building had to be jacked up, repaired, and slid back on a new foundation."

Based on an article prepared by APA - The Engineered Wood Association © 1997

This booklet was prepared by the Earthquake Program of the Association of Bay Area Governments (ABAG) with the American Red Cross Bay Area through a grant from the Allstate Foundation.

Additional Information Sources

Association of Bay Area Governments
ABAG offers a number of earthquake publications, including a video that can be obtained from ABAG at P.O. Box 2050, Oakland, CA 94604, or by phone at 510/464-7900.

Stand Up to the Quake – Get Your Home in Shape
(1999 video - $7 + $3 postage + tax) (available in English, Spanish, and Vietnamese)

Free earthquake information is available at **http://quake.abag.ca.gov.** You can read and print out:

1. Maps showing predicted severity of shaking by fault and by city (click on the "On Shaky Ground" button)
2. Lists of contractors who have taken our training to do structural retrofitting work, a list of home inspectors that we have trained, and a list of structural engineers with retrofit experience (click on "Mitigation")
3. Standard ways to fix both structural and non-structural problems, including strapping water heaters (click on "Mitigation")
4. Sources of money to help pay for retrofitting homes (click on "Mitigation").

California Governor's Office of Emergency Services (OES) Coastal Region Resource Center

OES offers publications and a video on strengthening wood-frame homes:

1. ***An Ounce of Prevention: Strengthening Your Wood Frame House for Earthquake Safety***
   - **Construction Guide (1993)**
   - **Video (1992)**
2. ***A Guide to Strengthening and Repairing Your Home (1995)***

OES has a variety of publications and audio-visual emergency preparedness materials about various subjects, including but not limited to home and family, schools, and businesses. To borrow a video or request free publications, phone the resource center at 510/286-0869.

California Seismic Safety Commission
The Commission has a general guide on how to identify typical earthquake weaknesses in your home. Home sellers are required by state laws to disclose these weaknesses to home buyers. To obtain a copy of *The Homeowners Guide to Earthquake Safety* (1997) (SSC Report 97-01, 28 pages), contact your Realtor, local Board of Realtors, or the Commission at 1755 Creekside Oaks Drive, Suite 100, Sacramento, CA 95833, or phone 916/263-5506. The cost is $3.25. It is also available for **free** on the Internet at – **http://www.seismic.ca.gov/sscpub.htm**

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